

ABSTRACT OF THE INVENTION

A substrate having a conductive layer is provided. A dielectric layer is then formed above the conductive layer. At least one via hole is then formed in the dielectric layer, to expose a portion of the conductive layer. The conductive layer is then covered with a gap fill polymer layer, to completely fill the via hole. A chemical mechanical polishing step is performed to remove the partial gap fill polymer layer on the outside of the via hole. An etching step, is performed to remove a portion of partial gap fill polymer layer remaining in the via hole, resulting in a partial gap fill polymer. A lithographic process is conducted to form a patterned photoresist layer over the dielectric layer. The photoresist layer has an opening that exposes the via hole and partial gap fill polymer. A portion of the dielectric layer exposed by the opening is etched away, to form a trench in the dielectric layer. The photoresist layer and the partial fill polymer layer are then removed, to expose a part of the conductive layer. The via hole and trench are filled with metal material, to form a plug and line simultaneously.